

# China's Role in Managing Greenhouse Gas Emissions: Introduction to Issues

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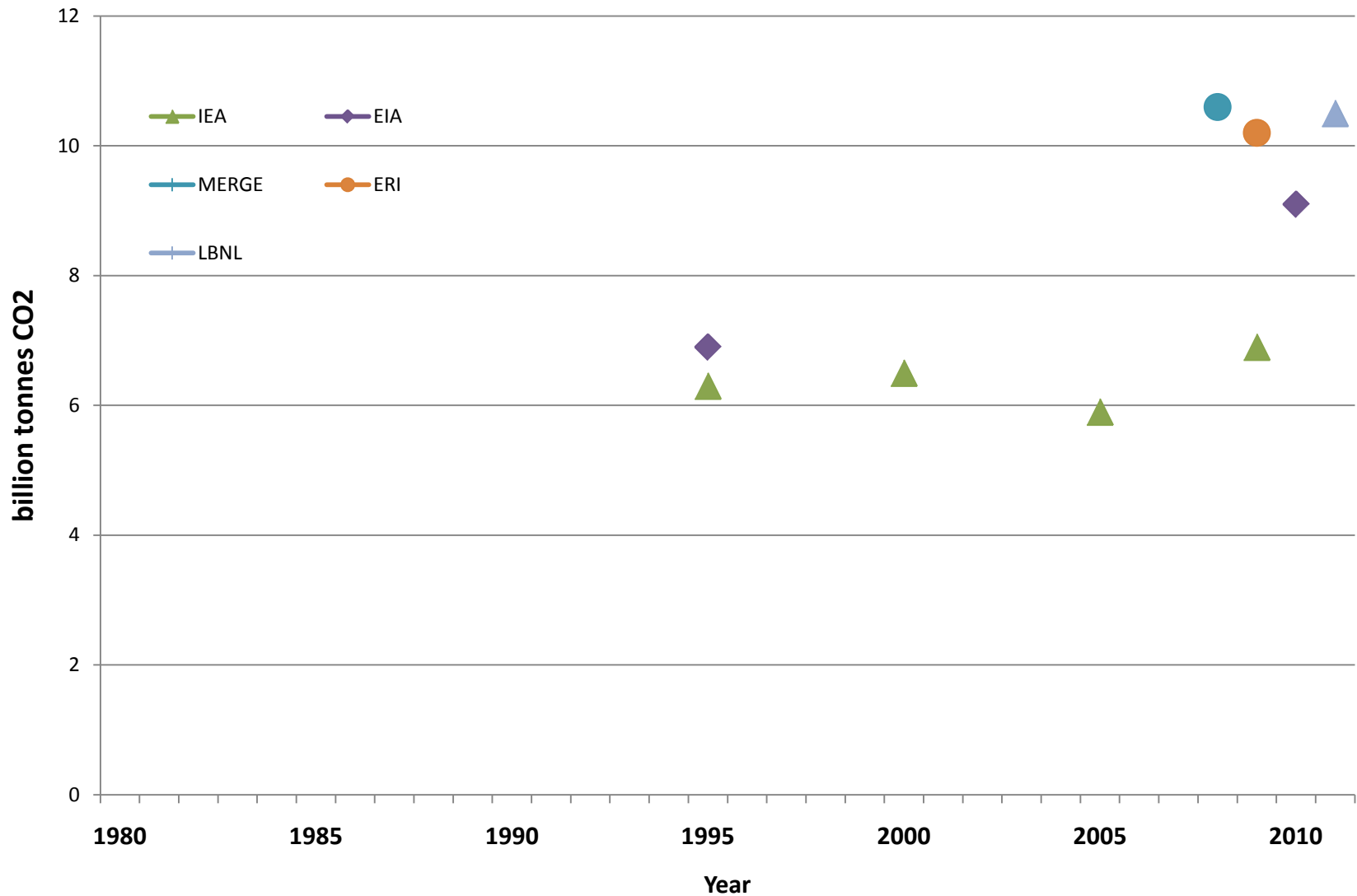
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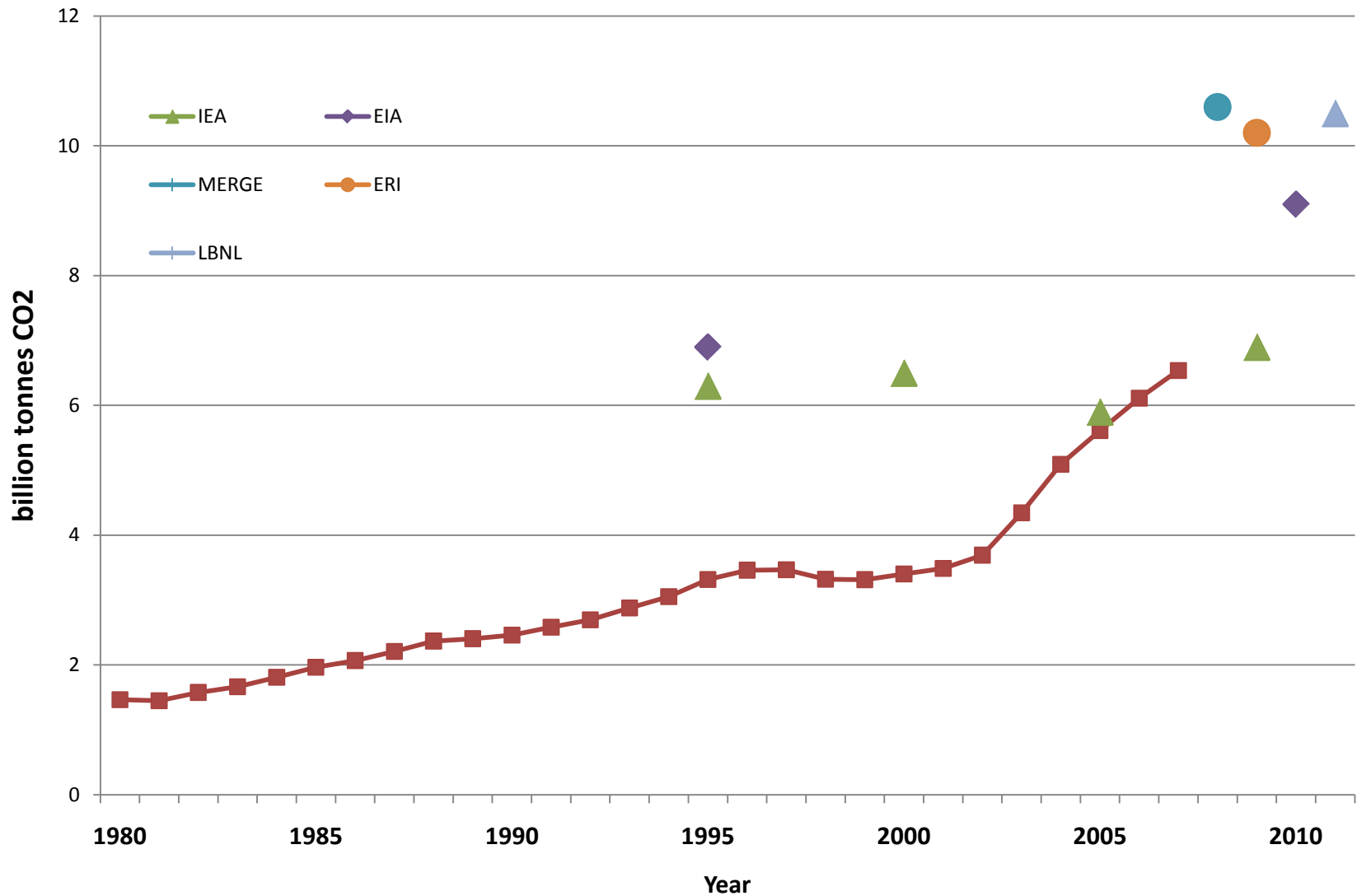
# Outline

- I. What do we really know about growth of China's GHG emissions?
- II. What has China done to control emissions?
- III. Changes in national innovation system in China
- IV. How can the United States better “engage” China?

# Chinese CO2 projections

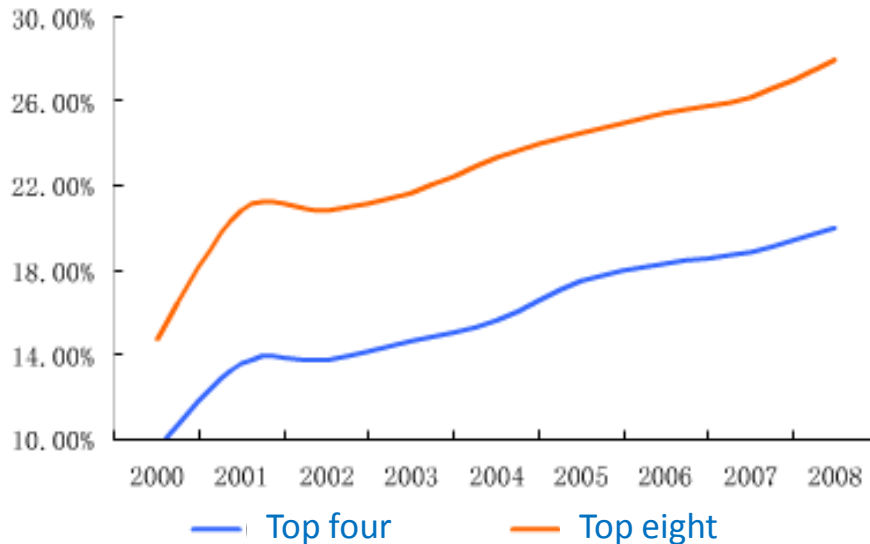


# Chinese CO2 projections



# Consolidation of China's coal industry

Consolidation change in China's coal industry



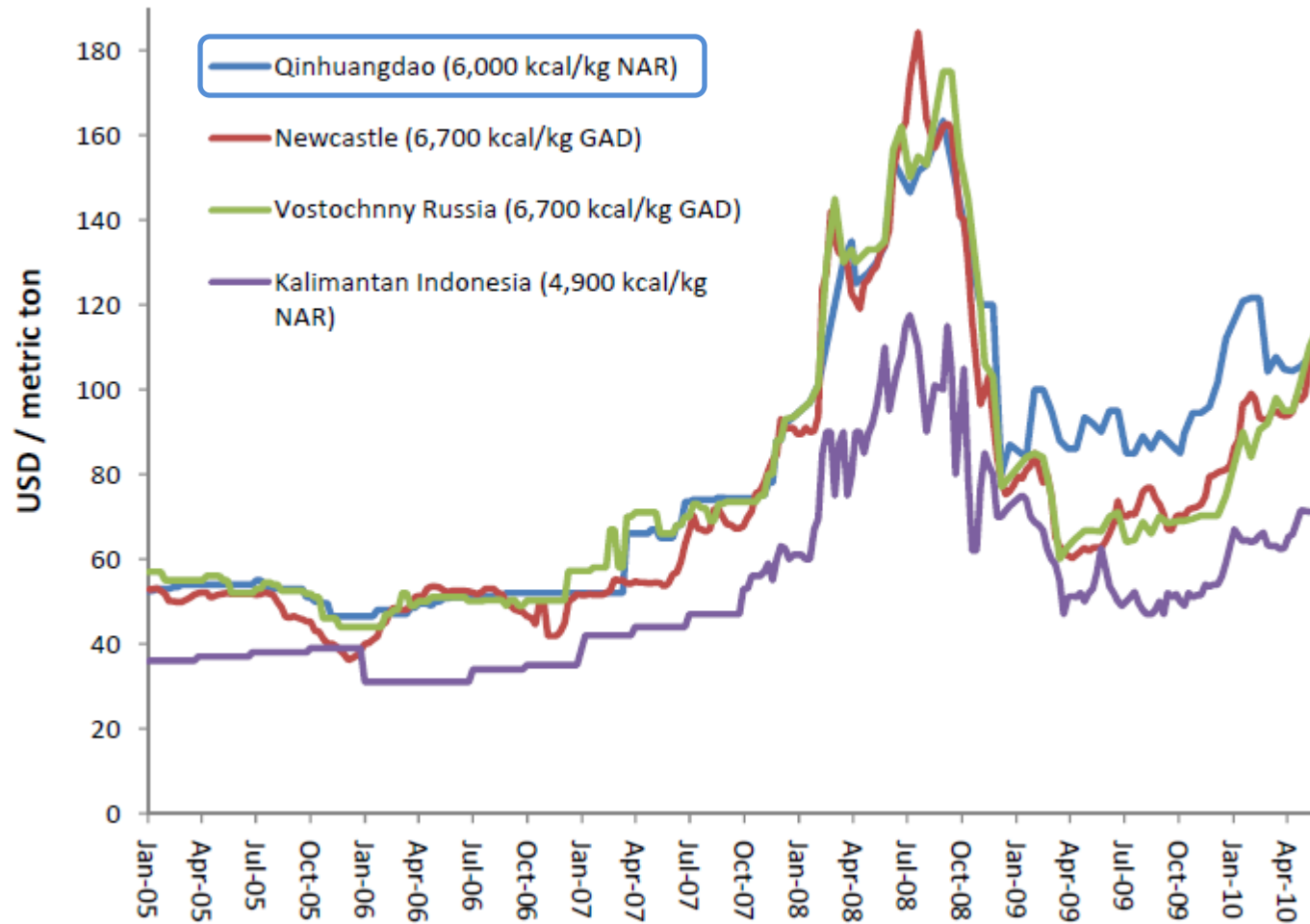
Production of top coal mining groups, 2008

Ranking	Enterprise	Production ( million tons)	Share (%)
1	Shenhua	282	10.4%
2	China Coal	114	4.2%
3	Shanxi Coking	80	2.9%
4	Datong Coal	69	2.5%
<b>total</b>		<b>545</b>	<b>20%</b>

Data source: China Coal Industry Association

- Government believes more consolidation is needed
- 12<sup>th</sup> Five-Year Plan: reduce number of coal enterprises from currently 11,000 to 4,000 by 2015

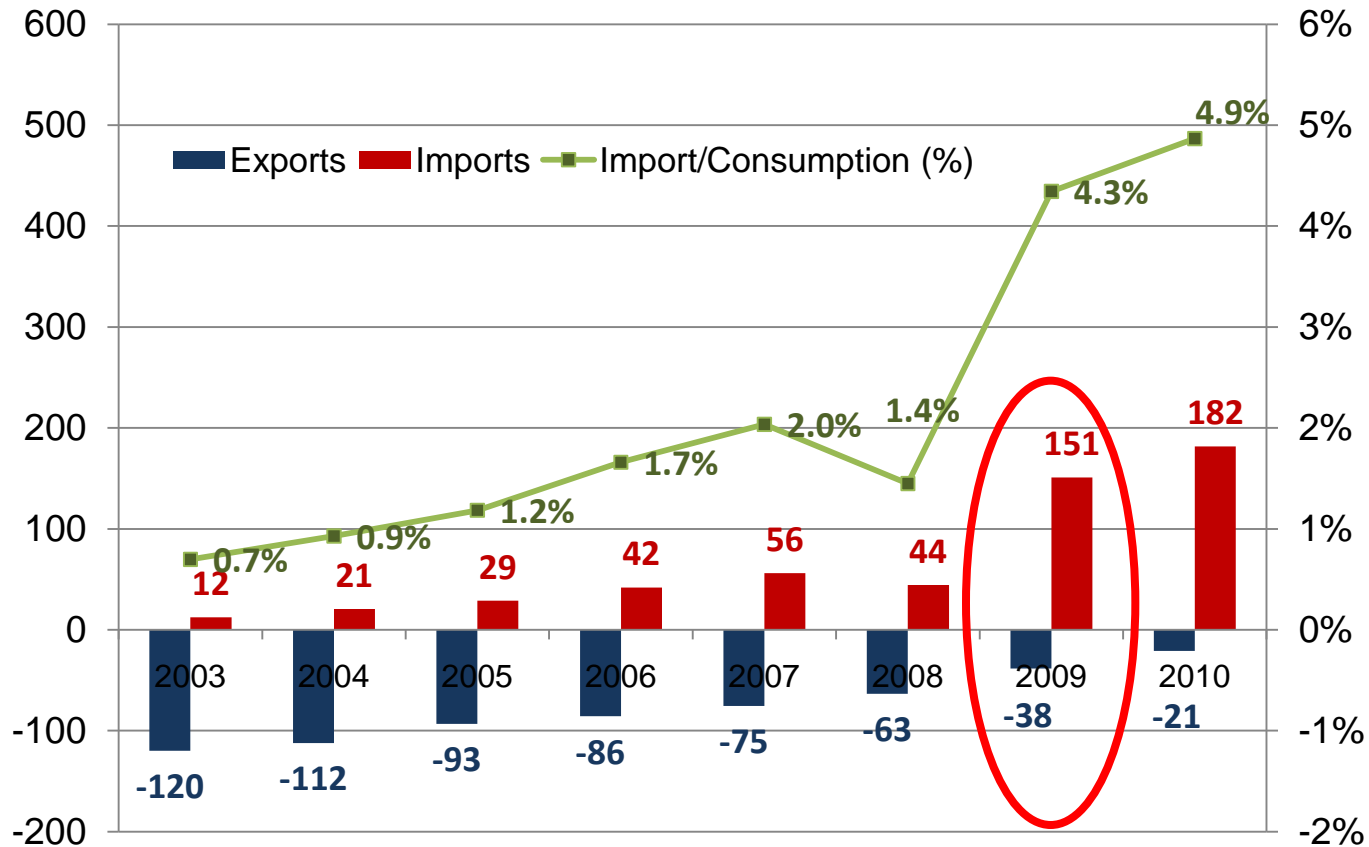
# Domestic coal prices have risen sharply above pre-2005 levels



Source: adapted from Morse and He (2010)

# China became a net coal importer in 2009

China's Export/Import of Coal in Million Short Tons



Data source: 2003 to 2009 data from EIA (2010) and 2010 data from Xinhua.net

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# China's progress on emission control

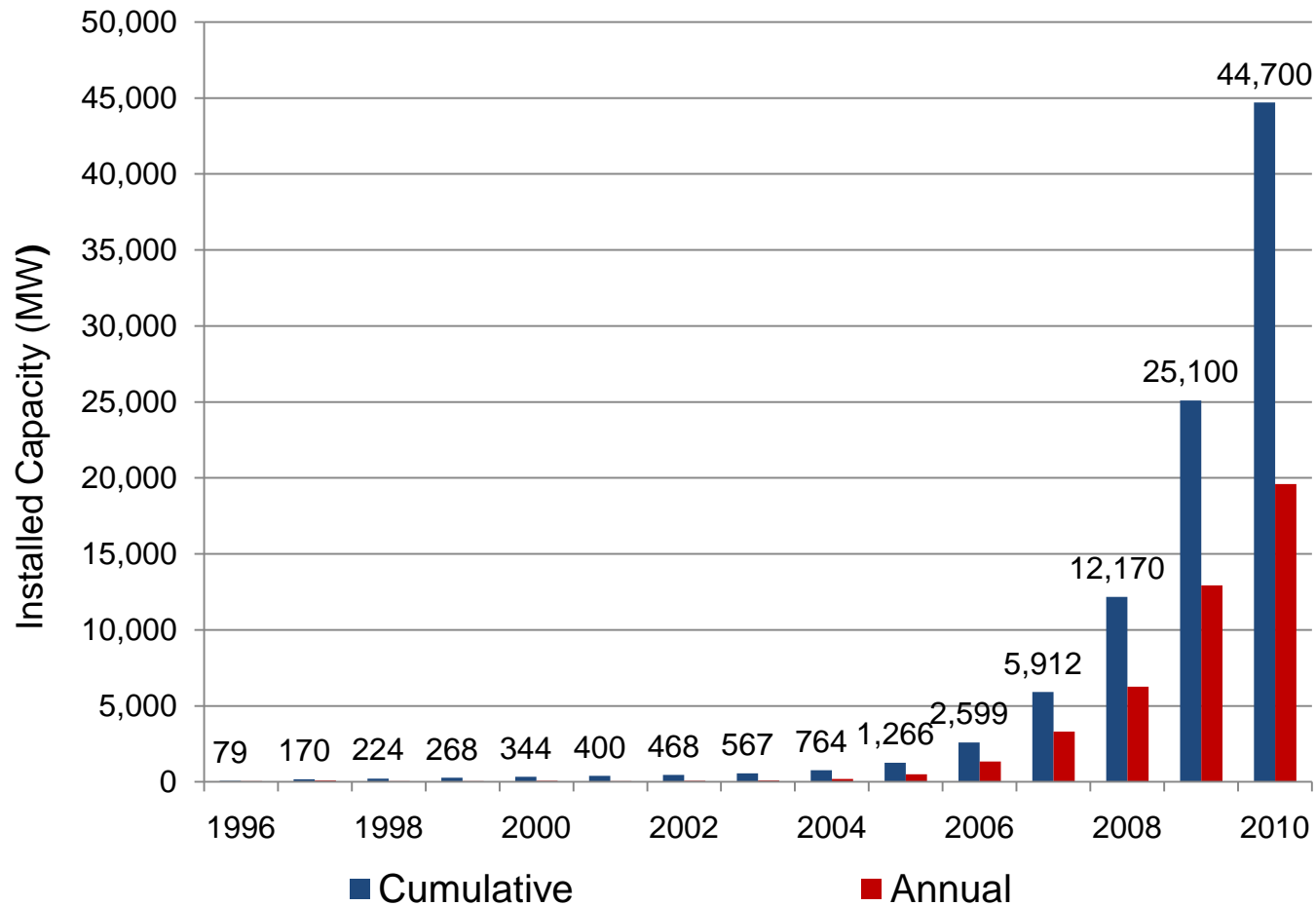
## I. Improving energy efficiency

- ❑ 11<sup>th</sup> Five Year Plan (FYP) (2006-2010): accomplished 19.1% drop in energy intensity, roughly meeting the 20% target
  - Ten Key Projects
  - Buildings Energy Efficiency
  - Top-1000 Program
  - Structural Optimization/Small Plant Closures
  - Appliance Standards
  - Provincial Energy Savings Programs
- ❑ 12<sup>th</sup> FYP (2011-2015): to achieve 16 to 17% drop in both energy intensity and CO<sub>2</sub> emission intensity

## II. Innovation around large, advanced energy projects (e.g. IGCC)

## III. Promoting renewables

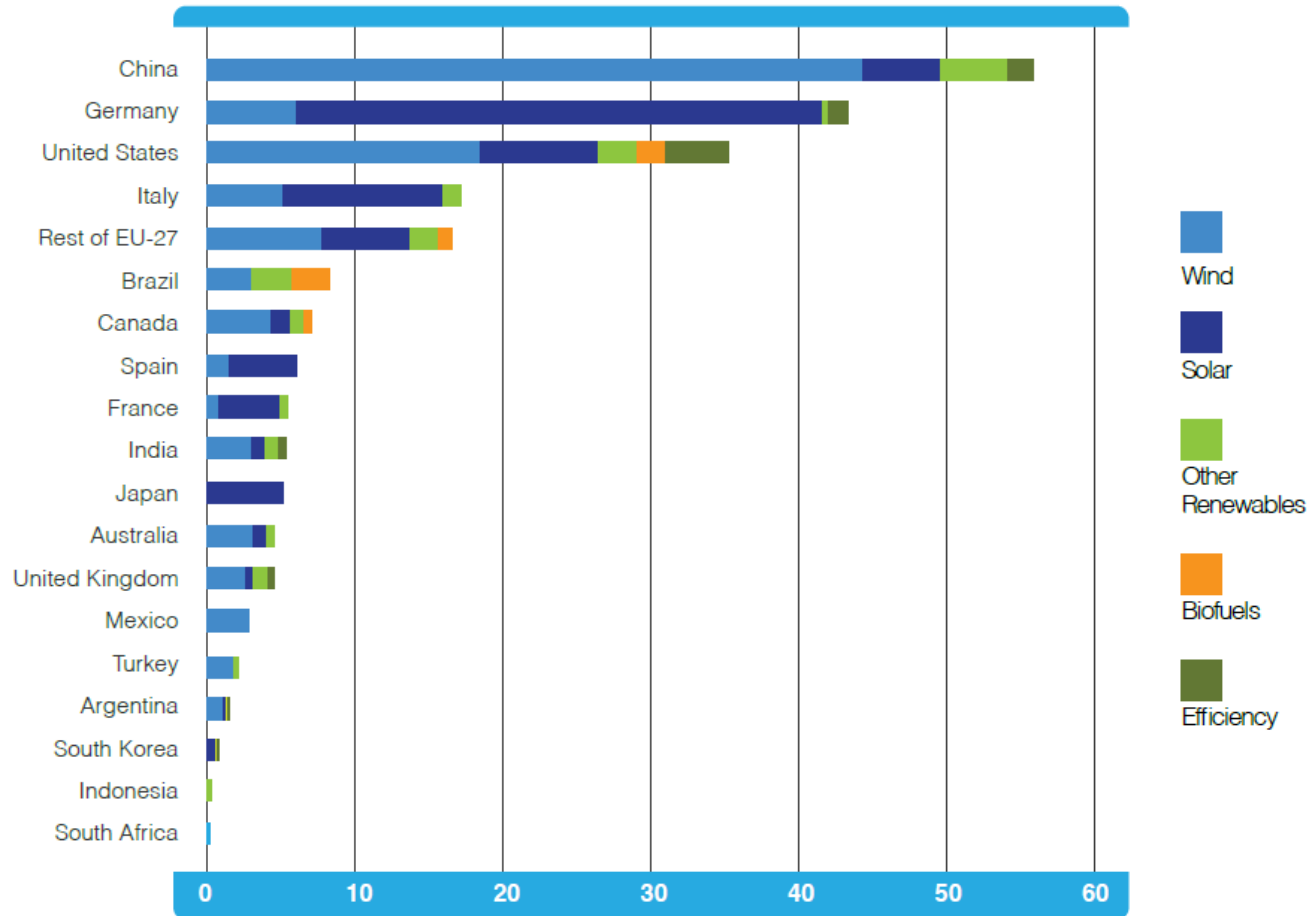
# China leads in installed wind power capacity



Data source: Li, et al. (2007), EIA (2010), and GWEC (2011)

# China leads in investing in clean power

Investment by country and sector, 2010 (Billions of \$)

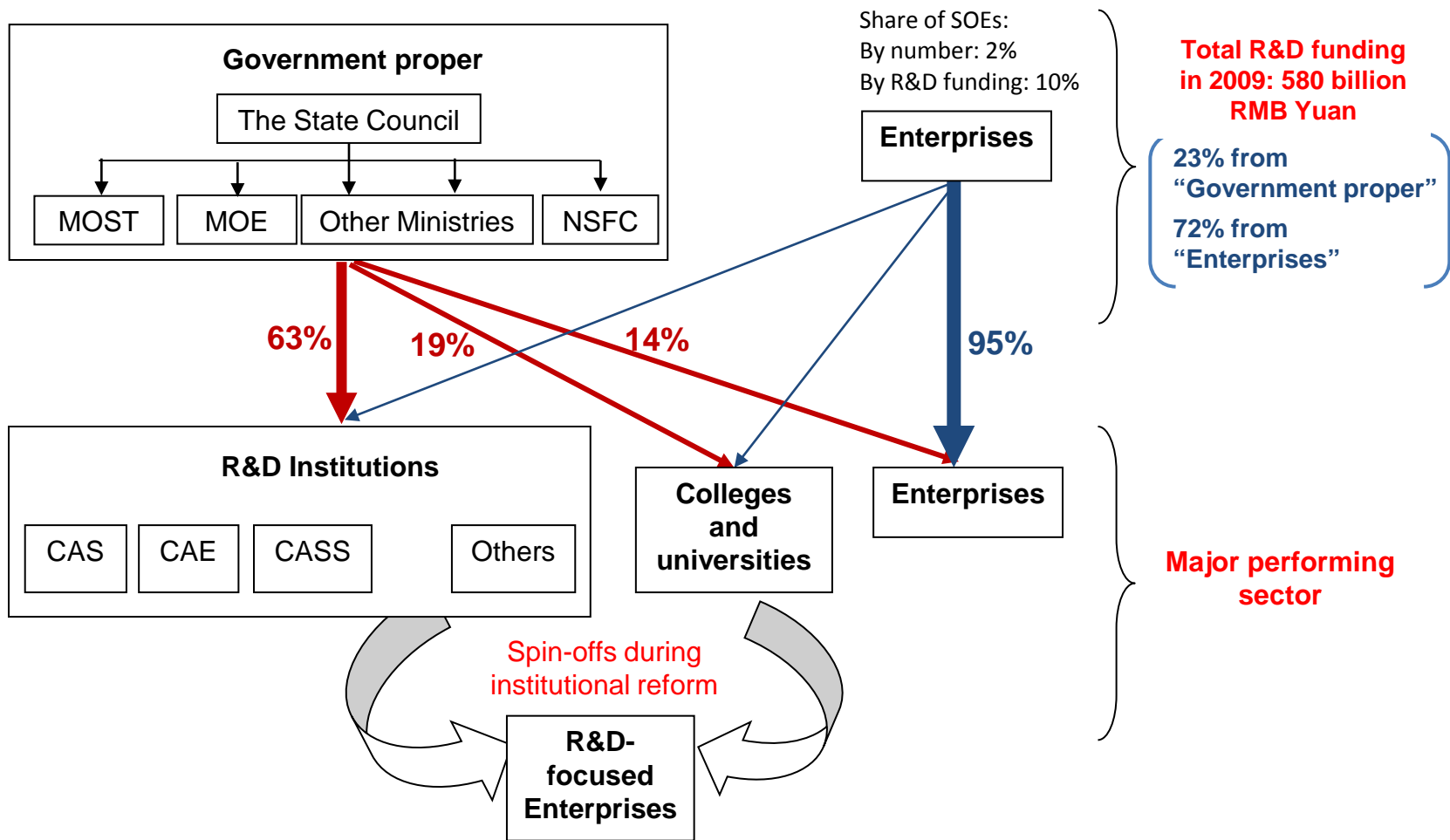


Source: The PEW Charitable Trust (2011) working with BNEF data

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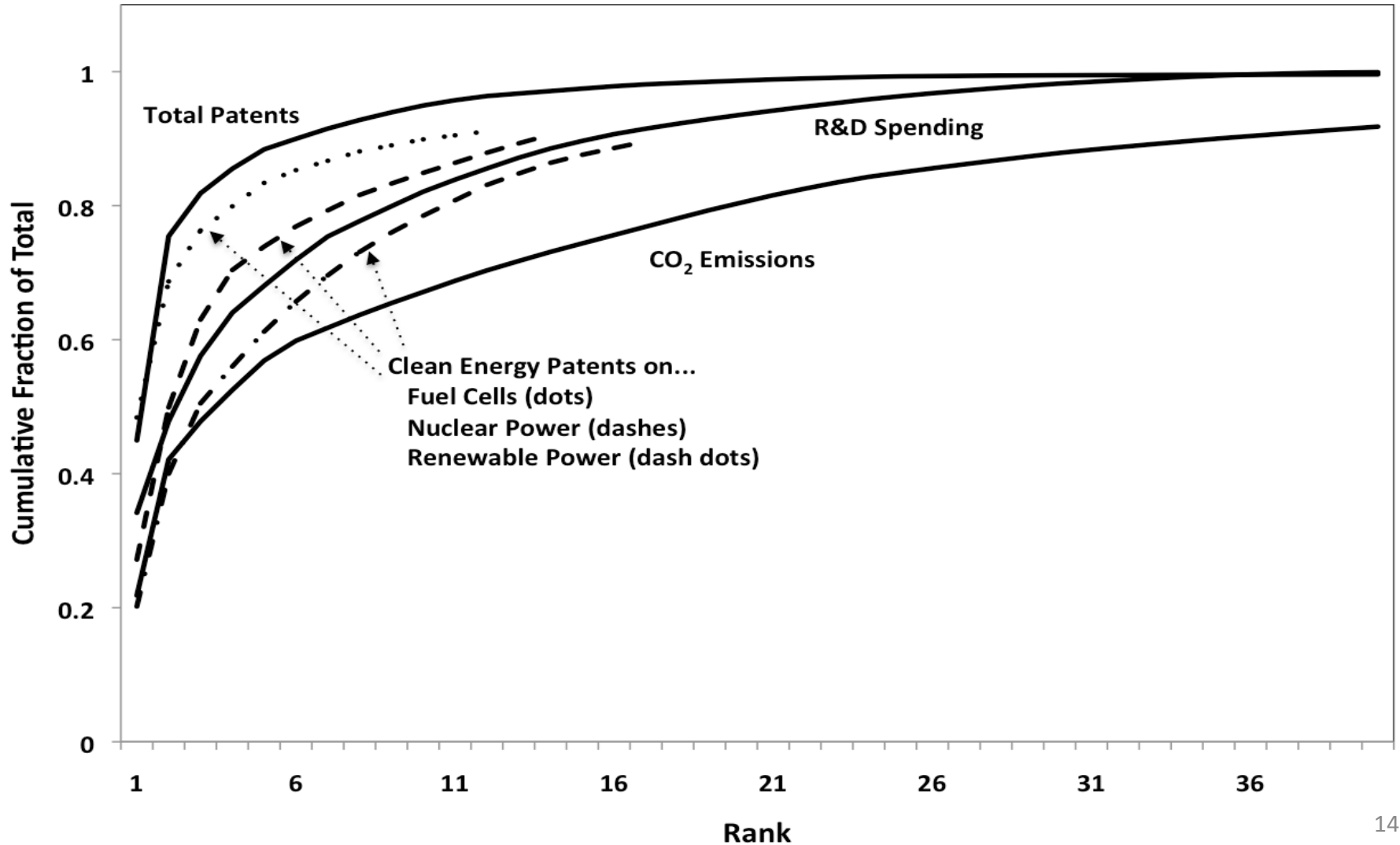
# National Innovation System in China



Note: R&D only; Does not include funding for demonstration, which is not available in state statistics.

# Who Matters?

## R&D Inputs, Outputs and CO2



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# How can the United States better “engage” China?

- I. Who’s engaging whom?
- II. Promising directions
  - I. Align with core national interests—energy security, local pollution control
  - II. Government to government partnerships
  - III. Private sector initiatives with dominant Chinese state-owned firms